

REMARKS

Upon careful and complete consideration of the Office Action dated October 7, 2002, applicants have amended the specification and claims which, when considered in conjunction with the comments herein below, are deemed to place the present application into condition for allowance. Favorable reconsideration of this application, as amended, is respectfully solicited.

The Office Action objected to the subject specification for lacking subheadings of the various sections. Applicants have accordingly amended the specification to include the applicable headings. Based on these amendments, applicant respectfully requests that the objection to the specification be withdrawn.

The Office Action has rejected Claims 1, 2, 5 and 6 under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 4,972,118 to Yorifuji et al. (hereinafter referred to as "Yorifuji et al.").

The present invention as presently claimed relates to a low-pressure mercury-vapor discharge lamp comprising a discharge vessel enclosing a discharge space provided with a filling of mercury and an inert gas in a gastight manner, said discharge vessel containing an amalgam which communicates with the discharge space, and a discharge means for maintaining an electric discharge in the discharge space, characterized in that the amalgam comprises a bismuth-lead compound having a lead content in the range between 35 and 60 at. %, a bismuth content in the range between 40 and 65 at. %, and a mercury content (as amended above) in the range between 0.05 and 0.75 at. %.

The amended mercury content of between 0.05 and 0.75 at. % was

originally found in claim 5. Claim 5 has accordingly been canceled. In rejecting original claim 5, the Office Action alleged that “Yorifuji discloses the mercury content being 0.5% (see Col. 3, line 17).” At column 3, lines 8-54, various samples of amalgam were made. Specifically, five amalgams were made with a 56.5 wt. % bismuth and a 43.5 wt.% lead, and varying amounts of mercury. The five amalgams had wt.% of mercury of 0.5, 1.0, 5.0, 12.0 and 17.0, respectively. These five amalgams were then compared with respect to their temperature stability and their changes in mercury vapor pressure.

As indicated at lines 40-47 of column 3 of Yorifuji et al., the amalgam including 17 wt.% mercury had an extremely narrow temperature stable range and a high mercury vapor pressure, rendering its use undesirable. To the contrary, Yorifuji et al. discloses in the following lines 47-51 that the amalgams including 12 wt.%, 5 wt.% and 1 wt.% all had desirable temperature stable ranges. Although Yorifuji et al. go on to indicate that “a stable temperature of the amalgam including bismuth-lead-mercury is achieved when the amount of mercury added to the above-described amalgam is small”, Figure 1 of Yorifuji et al. clearly shows that the amalgam having 0.5 wt.% of mercury was not as desirable as the amalgams having 12, 5 or 1 wt.% mercury as discussed above. Then, based on the composition ratio of bismuth and lead at the eutectic point, the lead/bismuth composition of the base metal of the amalgam of Yorifuji et al. was determined. Added to these lead/bismuth compositions, Yorifuji et al. clearly teaches the addition of 1.0 wt.% to 12 wt.% mercury. Yorifuji et al. have clearly dismissed two of the five tested amalgams referred to in column 3, i.e. they have decided not to use amalgams having either the high 17.0 wt.% mercury or the low 0.5 wt.% mercury. The Examiner’s attention is respectfully directed to column 4, lines 3-4; line 15; line 20; lines

51-52; column 5, lines 1-4 (“If the amount of mercury is excessively small, a shortage of mercury would occur because of the consumption of mercury during the operation.”); lines 24-25; column 6, lines 18-19; claim 1, lines 9-10; claim 9, lines 10-11; and abstract, lines 6-7 wherein Yorifuji et al. clearly teaches an amalgam having from 1 to 12 wt.% mercury, and further teaches away from amalgams having mercury contents either above or **below** said range.

Accordingly, it is respectfully submitted that Yorifuji et al. does not anticipate the present invention as claimed in claims 1, 3 and 4 as it does not teach or suggest an amalgam having a mercury content of between 0.05 and 0.75 at. %. To the contrary, Yurifuji et al. clearly teaches the use of a lead/bismuth amalgam having a mercury content of between 1 and 12 wt.%. Consequently, the skilled artisan reading Yurifuji et al. would not entertain the idea of employing any amalgams having less than a 1 wt.% mercury content.

Based on the arguments provided above, it is respectfully requested that the rejection of claims 1, 2, 5 and 6 under 35 U.S.C. § 102(b) based on Yurifuji et al. be withdrawn.

The Office Action then proceeded to reject claims 1, 3 and 4 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,952,780 to Forsdyke et al. (hereinafter referred to as “Forsdyke et al.”) in view of U.S. Patent No. 5,204,584 to Ikeda et al. (hereinafter referred to as “Ikeda et al.”). In making this rejection, the Office Action acknowledged that Forsdyke et al. fail to disclose an amalgam having a bismuth content as the amalgam in accordance with the present invention. Instead of teaching a lead/bismuth/mercury amalgam, Forsdyke et al. teach a lead/tin/mercury amalgam. To

make up for this acknowledged deficiency of Forsdyke et al., the Office Action relied on Ikeda et al. which show an bismuth/lead/mercury amalgam having the same properties as a tin/lead/mercury amalgam. Based on the fact that these amalgams of Ikeda et al. showed similar properties, the Office Action concluded that tin and bismuth were art recognized equivalents and that it would have been obvious to the skilled artisan to replace the tin in the amalgam of Forsdyke et al. with an equivalent amount of bismuth. Applicants respectfully disagree with the conclusions drawn by the Office Action.

In order to fully appreciate the teachings of a reference cited in an unobviousness rejection, that reference must be considered in its entirety. More specifically, the Court of Appeals for the Federal Circuit has stated:

It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one skilled in the art.

Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 796 F.2d 443, 449, 230 USPQ 416, 419 (Fed. Cir. 1986), cert. denied, 484 U.S. 823 (1987) (quoting In re Wesslau, 353 F. 2d 238, 241, 147 USPQ 391, 393 (CCPA 1965)).

The Office Action referred to Ikeda et al., Table II and amalgams k and s, and amalgams n and q. Amalgam k is comprised of Bi-Pb-Hg (4%), while amalgam s is comprised of Pb-Sn-Hg (4%). Amalgam n is comprised of Bi-Pb-Hg (4%) while amalgam q is comprised of Pb-Sn-Hg (4%). Both amalgams k and s show similar properties, as do amalgams n and q. The conclusion drawn by the Office Action is that since these amalgams show similar properties, bismuth and tin must be equivalent

therein. The Examiner's attention is respectfully directed to amalgams o and r in the same Table II of Ikeda et al. Amalgam o is comprised of Bi-Pb-Hg (15%) while amalgam r is comprised of Pb-Sn-Hg (15%). Based on the conclusion drawn by the Office Action, these amalgams should also show identical or similar properties. This is not the case. Amalgam o shows a "no good" for luminous flux at a high temp. area where amalgam r gives an intermediate result. Consequently, the conclusion drawn by the Office Action does not apply to all of the amalgam examples identified in Table II of Ikeda et al.


Applicants respectfully submit that the Office Action failed to consider Ikeda et al. in its entirety; thereby ignoring those portions of the reference that argued against a direct substitution of tin for bismuth in the amalgams. It is further contemplated that should tin and bismuth have been "art recognized equivalent materials" as alleged by the Office Action, it is inexplicable why Ikeda et al. did not claim such a combination. Also, it is similarly inexplicable that Forsdyke et al., having a priority date a couple of years following the issue date of Ikeda et al., and having discussed amalgams comprising bismuth, lead, tin and mercury as having the most promise, would not teach or suggest an amalgam as suggested by the Office Action, i.e. an amalgam in accordance with the present invention and one containing lead, mercury and bismuth. The facts remain. Forsdyke et al. clearly teach amalgams comprising lead, mercury and tin. As acknowledged by the Office Action, Forsdyke et al. fail to teach the bismuth content as claimed by the present invention. Further, the Office Action's reliance on Ikeda et al. is flawed in that the same table on which the Office Action relied on to show the equivalence of tin and bismuth also have amalgams which show their non-equivalence.

Based on the arguments submitted above, the rejection of claims 1, 3 and 4 under 35 U.S.C. §103(a) is requested to be withdrawn.

It is further noted that applicants enclose a copy of **“Version With Markings to Show Changes Made”** indicative of the amendments being implemented herewith.

Finally, it is further submitted that all the claims in the application contain patentable subject matter and a Notice of Allowance is respectfully solicited.

Respectfully submitted,



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Encl. (Version with Markings to Show Changes Made)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

On pages 1, 3 and 6, section headings have been inserted into the disclosure.

IN THE CLAIMS

Claim 5 has been canceled and claim 1 has been amended as follows:

1. (Amended) A low-pressure mercury-vapor discharge lamp comprising a discharge vessel (10),
which discharge vessel (10) encloses a discharge space (11) provided with a filling of mercury and an inert gas in a gastight manner,
which discharge vessel (10) contains an amalgam (63) which communicates with the discharge space (11),
and the low-pressure mercury-vapor discharge lamp comprises discharge means (41a, 41b) for maintaining an electric discharge in the discharge space (11), characterized in that the amalgam (63) comprises a bismuth-lead compound having a lead content (Pb) in the range between $35 \leq \text{Pb} \leq 60$ at.%, a bismuth content (Bi) in the range between $40 \leq \text{Bi} \leq 65$ at.%, and a mercury content (Hg) in the range between $0.05 \leq \text{Hg} \leq [1] \underline{0.75}$ at.%.